IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application	:	Kazushige Yoshioka
Application No.	:	09/919,561
Filed	:	July 31, 2001
For	:	NATURAL FEATHERED FIBER INSULATOR
Examiner	:	Jill M. Gray
Attorney's Docket	:	AK-356XX

Group Art Unit: 1774

* *

I hereby certify that this correspondence is being sent via facsimile to Examiner Jill M. Gray, Group Art Unit 1774, Fax No. (703) 305-5408, on 4-1-3.

By: _____
Charles L. Gagnebin III
Registration No. 25,467
Attorney for Applicant

* *

DECLARATION UNDER 37 CFR 1.132

Via Facsimile
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I, Kazushige Yoshioka, c/o Kami Shoji Co., Ltd. 2-27, Miyagawa 1-chome, Iyomishima-shi, Ehime-ken, Japan, hereby declare as follows:

1. I am the inventor of the above mentioned patent application.

2. I have received training in applied chemistry , having received a degree from the Faculty of Engineering, Kanagawa University, 3-27-1 rokkakubashi, Kanagawa-ku, Yokohama-shi, Kanagawa-ken, Japan in 1994.

3. I have had work experience in the development of functional specialty paper and related areas at Kami Shoji Co., Ltd. since 1994.

4. I understand that the Examiner for U.S. Patent Application Serial No. 09/919,561 has rejected claims of this application in part because the Examiner believes that the insulator claimed in the instant application is well known in the art, as exemplified by Kean ('186).

5. The following experiment was conducted in order to compare the heat conduction of the insulator of the instant invention to that of a conventional cellulose fiber insulator.

The heat conduction (kcal/m·h·C) of an insulator is often dependent on its density. So, three insulators of the present invention having different densities were manufactured by the use of a method described in page 4, line 19 to page 5, line 6 of the present specification, and their heat conductions were measured according to JIS A 1412-2 as described in page 5, lines 15 to 20.

Results including those for one sample (Exp. No.4 in TABLE 1) appearing in page 6, lines 21 to 25 of the present specification are summarized in TABLE 1. It is demonstrated that insulators of the present invention show a density-heat conduction curve which is mild and has a minimum value of a heat conduction, and that insulators of the present invention having about 29 to 33 kg/m^3 are evaluated as that of an insulator class D described in TABLE 2.

TABLE 2 is an English translation of a part of a specification of a building issued by Government Housing Loan Corporation, Japan, and specifies the classification of insulators based on the performance capability of insulation. When a person desires to be financed by Government Housing Loan Corporation upon construction of a house, the person must use an insulator having a thickness which depends on the insulator class described in TABLE 2. According to the specification by the above Corporation, an insulator of the class D having a thickness of 150 mm corresponds to an insulator of the class C having a thickness of 175 mm. Such a difference in thickness is significantly important from the view points of the cost of other construction materials and the flexibility of designing a house.

Kean et al. (USP 5,491,186) has disclosed a thermal insulating batt comprising a thermally bonded fiber structure consisting essentially of a secondary cellulose fiber and a sheath-core bicomponent fiber. Densities of insulating batts according to Kean et al. are shown in the table in column 5, which are 1.38 to 1.75 lbs./cu.ft., that is, ca. 22.1 to 28.0 kg/m^3. Insulating batts according to Kean et al. is considered to be similar to the cellulose

fiber 25 K (25 K means the density of 25 kg/m^3) in TABLE 2, which is classified to the insulator class C. TABLE 2 indicates that cellulose fiber insulators can not be ranked to be the insulator class D over a wide range of density of 25 to 55 kg/m^3, including an insulator with an adhesive. In contrast, insulators of the present invention provide insulators of the insulator class D in a practical width of density range of about 29 to 33 kg/m^3.

TABLE 1

Example No.	density	thickness	heat conductivity	heat conduction
1	19.6 kg/m^3	29 mm	0.035 W/m·K	0.0304 kcal/h
2	29.5 kg/m^3	29 mm	0.033 W/m·K	0.0287 kcal/h
3	32.5 kg/m^3	40 mm	0.033 W/m·K	0.0285 kcal/h
4	34.1 kg/m^3	25 mm	0.035 W/m·K	0.0301 kcal/h

TABLE 2

Insulator class	heat conduction	type of insulator
A-1	0.045 to 0.044 kcal/(m·h·C) [0.052 to 0.051{W/(m·K)}]	Glass wool for suction GW1, GW2 Rock wool for suction 35K Siding board
A-2	0.043 to 0.040 kcal/(m·h·C) [0.050 to 0.046{W/(m·K)}]	Glass wool for housing 10K or equivalent Rock wool for suction 25K A class insulation board
B	0.039 to 0.035 kcal/(m·h·C) [0.045 to 0.041{W/(m·K)}]	Glass wool for housing 16K or equivalent Bead method polystyrene foam No.4

		Polyethylene foam B grade Japanese tatami board
C	0.034 to 0.030 kcal/(m·h·C) [0.040 to 0.035{W/(m·K)}]	Glass wool for housing 24K, 32K or equivalent High performance glass wool 16K, 24K or equivalent Glass wool for suction 30K, 35K or equivalent Rock wool for housing (mat, felt, board) Bead method polystyrene foam No.1, No.2, No.3 Extrusion method polystyrene foam grade 1 Polyethylene foam grade A Cellulose fiber for suction 25K Cellulose fiber for suction 45K, 55K (used with adhesive) Phenol foam heat-retention plate grade 2 No.1
D	0.029 to 0.025 kcal/(m·h·C) [0.034 to 0.029{W/(m·K)}]	Bead method polystyrene foam Special No. Extrusion method polystyrene foam grade 2 Phenol foam heat-retention plate grade 1 No.1, No. 2, grade 2 No. 2
E	0.024 kcal/(m·h·C) [0.028 or less{W/(m·K)}]	Extrusion method polystyrene foam grade 3 Rigid urethane foam Spray rigid urethane foam (foamed on site)

The above data and discussion indicate that the present invention can provide an insulator having the insulation performance capability which is significantly superior to that of an insulating batt according to Kean et al.

6. I declare further that all statements made herein to my knowledge are true and that all statements made on

information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

March 24, 2003

Kazushige Yoshioka

Date

Kazushige Yoshioka

286827v2